

We Claim:

1. An isolated nucleic acid encoding Opa1.
2. The isolated nucleic acid of Claim 1 comprising the nucleotide sequence of nucleotides 880-1680 of Figure 2A.
3. The isolated nucleic acid of Claim 1 comprising the nucleotide sequence of nucleotides 880-1680 of Figure 2B.
4. The isolated nucleic acid of Claim 1 having one or more mutations.
5. The nucleic acid of Claim 4 wherein the mutations are selected from the group consisting of a point, insertion rearrangement or deletion mutation.
6. An isolated nucleic acid that hybridizes under high stringency conditions to a nucleic acid that is complementary to the nucleotide sequence of Figure 2A or a contiguous fragment thereof, wherein said isolated nucleic acid encodes a protein having the biological activity of Opa1.
7. An isolated nucleic acid that hybridizes under high stringency conditions to a nucleic acid that is complementary to the nucleotide sequence of Figure 2B or a contiguous fragment thereof, wherein said isolated nucleic acid encodes a protein having the biological activity of Opa1.
8. A purified Opa1 protein.

9. A purified Opa1 protein encoded by the nucleic acid of Claim 1.

10. The purified Opa1 protein of Claim 9, wherein the nucleic acid comprises the nucleotide sequence of nucleotides 880-1680 of Figure 2A.

11. The purified Opa1 protein of Claim 9, wherein the nucleic acid comprises the nucleotide sequence of nucleotides 880-1680 of Figure 2B.

12. The purified Opa1 protein of Claim 9, wherein the nucleic acid hybridizes under high stringency conditions to a nucleic acid that is complementary to the nucleotide sequence of Figure 2A or a contiguous fragment thereof.

13. The purified Opa1 protein of Claim 9, wherein the nucleic acid hybridizes under high stringency conditions to a nucleic acid that is complementary to the nucleotide sequence of Figure 2B or a contiguous fragment thereof.

14. A vector comprising the nucleic acid of Claim 1.

15. The vector of Claim 14, wherein the nucleic acid comprises the nucleotide sequence of nucleotides 880-1680 of Figure 2A.

16. The vector of Claim 14, wherein the nucleic acid comprises the nucleotide sequence of nucleotides 880-1680 of Figure 2B.

17. The vector of Claim 14, wherein the nucleic acid hybridizes

Sequence of Nucleotide 880-1680 of Figure 2A and Contiguous Fragments Thereof

18. The vector of Claim 14, wherein the nucleic acid hybridizes under high stringency conditions to a nucleic acid that is complementary to the nucleotide sequence of Figure 2B or a contiguous fragment thereof.

19. A host cell comprising the vector of Claim 14.

20. The host cell of Claim 19, wherein the nucleic acid comprises the nucleotide sequence of nucleotides 880-1680 of Figure 2A.

21. The host cell of Claim 19, wherein the nucleic acid comprises the nucleotide sequence of nucleotides 880-1680 of Figure 2B.

22. The host cell of Claim 19, wherein the nucleic acid hybridizes under high stringency conditions to a nucleic acid that is complementary to the nucleotide sequence of Figure 2A or a contiguous fragment thereof.

23. The host cell of Claim 19, wherein the nucleic acid hybridizes under high stringency conditions to a nucleic acid that is complementary to the nucleotide sequence of Figure 2B or a contiguous fragment thereof.

24. A method of making Opa1 protein comprising the steps of:
a) introducing nucleic acid encoding Opa1 into a host cell;
b) maintaining said host cell under conditions whereby said nucleic acid is expressed to produce Opa1 protein; and
c) recovering said Opa1 protein.

25. A method of inducing growth or regeneration of nervous tissue comprising administering an effective amount of Opa1 protein to said tissue to induce growth or regeneration of the nervous tissue.

26. A method of inducing growth or regeneration of nervous tissue comprising administering a nucleic acid encoding Opa1 protein to said tissue in effective amounts to induce growth or regeneration of the nervous tissue.

27. A method of inducing growth or regeneration of nervous tissue comprising contacting said tissue with an effective amount of host cells expressing Opa1 to induce growth or regeneration of the nervous tissue.

28. A glial cell transduced with a vector, said vector comprising and expressing a nucleic acid encoding Opa1 protein, wherein the transduced cell provides biologically active Opa1 protein.

29. A composition comprising Opa1 and a carrier.

30. A method for inducing growth or regeneration of nervous tissue comprising contacting the nervous tissue with a modulator of Opa1 expression in an amount effective to induce or enhance expression of Opa1 and induce growth or regeneration of the nervous tissue.

31. A method for providing biologically active Opa1 to the cell of an individual in need of nervous tissue growth or regeneration, comprising:

(a) isolating autologous host cells from the individual in need of

(b) transducing the isolated host cells with an expression vector that contains and expresses the nucleic acid encoding Opa1; and

(c) transplanting the transduced autologous host cells into the individual in need of nervous tissue growth or regeneration so as to provide to the individual biologically active Opa1.

32. A method for evaluating an agent that may induce nervous tissue growth or regeneration, comprising the steps of:

(a) contacting a candidate agent with nervous tissue; and

(b) detecting the level of Opa1 expressed in the nervous tissue, wherein an increased level of Opa1 expression may be indicative of the agent being a nervous tissue growth or regeneration inducer.